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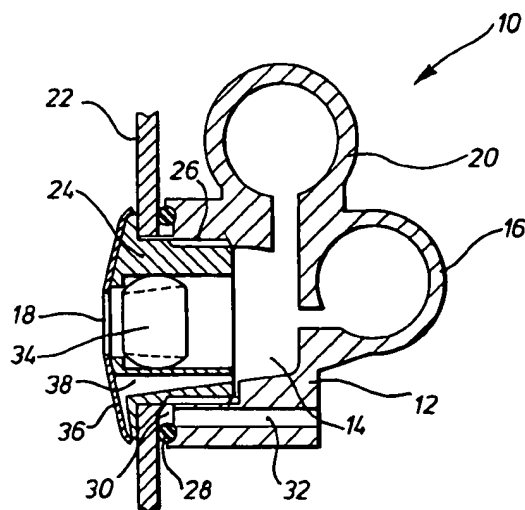
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Cullingworth, West Yorkshire(GB)(74) Representative: **Wharton, Peter Robert et al**
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Alliance House,
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Bradford, BD1 1QB (GB)(54) **Hydro-therapy jet drainage.**

(57) A jet for a whirlpool bath which comprises a main body (12) having a chamber (14) therein in which water and air may be mixed and a jet orifice (18) within which there is a swivellable doughnut-shaped plastics material member (34) enabling the direction of the water jet to be altered characterised in that a bore (38) is positioned below the jet orifice at or near the lower-most point of the jet whereby to drain water otherwise trapped behind the member (34). This jet of the invention reduces trapped water in whirlpool bath systems to negligible proportions.

**FIG.1.****EP 0 565 158 A1**

This invention relates to hydro-therapy and whirlpool baths, and in particular relates to an improved form of jet for use therewith.

Hydro-therapy or whirlpool baths, in which a number of jets below the water line direct water, usually mixed with air, towards the bather, are becoming increasingly popular. In essence a number of jets are connected together and are fed with water re-circulated from the bath by a pump. A separate line may deliver air to the jets also where it is desired to have the "frothy" effect of entrained air.

One problem with such baths is that of drainage. When the bath is emptied the jets and associated pipe-ware may retain water which, if allowed to stand for a period of time, can go stagnant and give rise to growth to harmful organisms and/or produce offensive smells. The jet and piping system described in our British patent publication 2147523 was specifically designed to reduce the volume of water trapped in a whirlpool bath jet system and so reduce this problem. Nevertheless, even with that system, a typical whirlpool bath comprising six jets might still trap 20-40 mls of water after the bath has been emptied. This is, of course, considerably better than the accepted minimum standard of 45 mls per fitting below the waterline, equivalent to about 315 mls of retained water where six jets and one suction fitting are employed.

The invention seeks to provide a jet in which water retention is reduced further still.

According to the present invention there is provided a jet for a whirlpool bath which comprises a drain-port positioned below the jet orifice at or near the lower-most point of the jet.

The invention will be described further, by way of example, with reference to the accompany drawings, in which:

- Figure 1 is a sectional view through a jet modified in accordance with the invention;
- Figure 2 is a front view of the jet of Figure 1;
- Figure 3 is a partial sectional view corresponding to Figure 1 on an enlarged scale; and
- Figure 4 is a front view of the jet bezel.

Referring to the drawings, Figures 1 to 4 show a jet very much as described in our European patent publication 0234723 but modified in accordance with the present invention. The jet generally designated 10 comprises a main body 12 having a chamber 14 therein in which water and air may be mixed. Water is provided to the mixing chamber 14 by means of pipe 16 and exits into the bath via a jet orifice 18. Air is provided to the chamber by means of an air-pipe 20.

The jet is held in place on the bath wall 22 by means of a bezel 24 which is screwed into the jet body at 26. An O-ring 28 is provided between the

rear of the bath wall and the jet body to provide a water seal. A recess 30 defined by the O-ring 28 connects with a bore 32 which may be used to inject sealant into the recess and effect a water-tight seal with a minimum of manual handling.

Within the jet orifice 18 there is positioned an "eye-ball" 34, which is a swivellable doughnut-shaped plastics material member enabling the direction of the water jet to be altered. The bezel 24 is covered by a facia plate 36 which screws into the central orifice 18.

The jet described thus far is entirely in accordance with our published European patent specification 0234723. The "V"-shaped configuration of the water-pipes 16 at each jet ensures that the jets are at the lowest point in the pipe-run which aids drainage. However, despite this, a small amount of water can be retained behind the eye-ball 34 in the mixing chamber 14. This may be exacerbated by the modern tendency for the jet orifices 18 to be made smaller (and thus the thickness of the eye-ball to be made greater) coupled with the tendency to provide more jets per bath.

In accordance with the invention a bore or drain port 38 is provided in the bezel 24 connecting the lowest point of the mixing chamber 14 with the bath interior. So as to ensure that the water thus allowed to drain from the mixing chamber 14 does not become trapped behind the facia 36, the latter is scalloped at 40 thus ensuring it does not sealingly engage with the inner surface of the bath wall 22.

Figure 4 illustrates a preferred form of bezel which would normally have six circumferentially equidistantly spaced holes 42 in its outer face. These are provided to enable a tool to be inserted to tighten the bezel up. The holes are not deep but are sufficient to provide purchase for a tool. It is convenient to use one or more of these holes to drill further through to the rear face of the bezel and thus provide the port 38. One way of providing the modified jet in accordance with the invention is to place the jet on the bath wall 22 and screw the bezel 24 into it until the O-ring 28 is compressed. A fitter should ensure that one of the holes 42 is at the lower-most point. This hole is then drilled by the fitter backwards through the bezel body until it forms the port 38 and connects with the chamber 14. Grooves 44 are provided in the bezel face connecting with each of the holes 42 so that whichever one is chosen there is a unobstructed path for the draining water. In an alternative construction each of the holes 42 may be drilled out providing six ports 38 and, once again during fitting, one of the holes 42 and its associated port 38 is arranged to be at the vertically lower most point. There is sufficient "give" in the O-ring so that it is not difficult to do this in practice. The facia in 36 is

then placed over the bezel 24 in the normal way.

The drain port 38 may, in an alternative construction, be formed in the body 12 rather than bezel 24, and may be moulded rather than drilled. It may also be formed partly in the body 12 and partly in the bezel 24.

The jet in accordance with the invention shows spectacular improvements in water retention over even the system of our above mentioned British and European patents. In one trial, a six jet bath was emptied and allowed to drain overnight. The jet system was disassembled and retained water measured. Less than 5 ml of water in total was retained. Such a low water retention is functionally equivalent to total drainage since such a small quantity of water would soon evaporate leaving the jet and pipe system totally dry.

Since most bath walls slope outwardly slightly, typically 6 to 8 degrees, it is preferred that the port 32 is arranged to slope upwardly by at least this amount so that when in place on the bath there is a net downward slope on the port 38 assisting drainage.

Claims

1. A jet for a whirlpool bath which comprises a main body 12 having a chamber 14 therein in which water and air may be mixed and a jet orifice 18 within which there is there is a swivellable doughnut-shaped plastics material member 34 enabling the direction of the water jet to be altered characterised in that a bore 38 is positioned below the jet orifice at or near the lower-most point of the jet whereby to drain water otherwise trapped behind the member 34.
2. A jet as claimed in claim 1 in which the bore or drain port 38 is provided in a bezel 24 connecting the lowest point of the mixing chamber 14 with the bath interior.
3. A jet as claimed in claim 2 in which the bezel 24 is covered by a facia 36 which is scalloped to ensure it does not sealingly engage with the inner surface of the bath wall 22 and prevent egress of the water.
4. A jet as claimed in either of claims 2 or 3 in which the bezel has six circumferentially equidistantly spaced holes 42 in its outer face to enable a tool to be inserted to tighten the bezel up.
5. A jet as claimed in claim 4 in which one or more of the holes 42 is extended to the rear face of the bezel and thus provides the port

38.

6. A jet as claimed in claim 5 in which grooves 44 are provided in the bezel face connecting with each of the holes 42 so that whichever one is chosen there is a unobstructed path for the draining water.
7. A jet as claimed in claim 1 in which the drain port 38 is formed in the body 12, preferably by moulding, or is formed partly in the body 12 and partly in the bezel 24.
8. A jet as claimed in any of claims 1 to 7 in which the port 32 is arranged to slope upwardly by about 6 to 8° so that when in place on the bath there is a net downward slope on the port 38 assisting drainage.

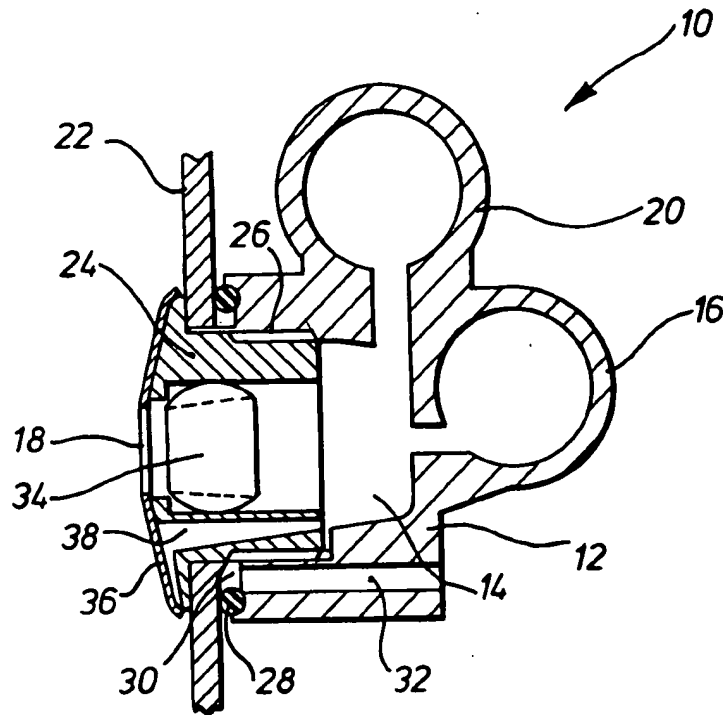


FIG. 1.

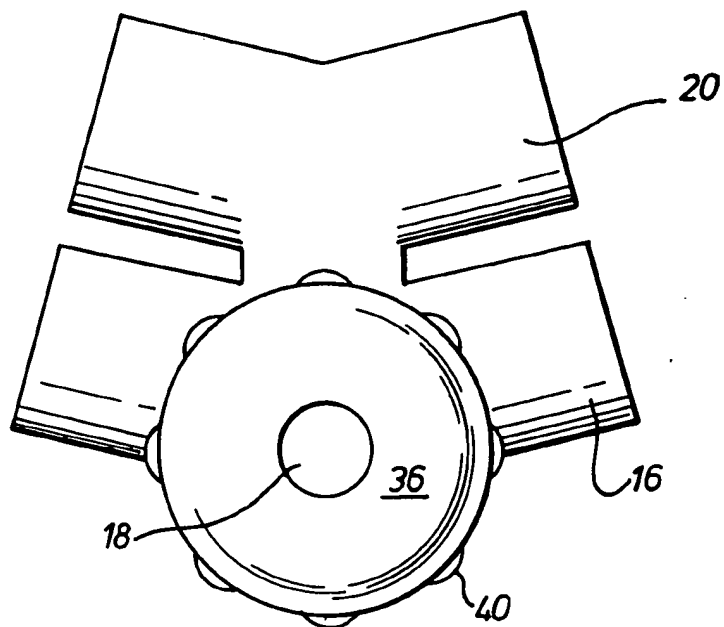


FIG. 2.

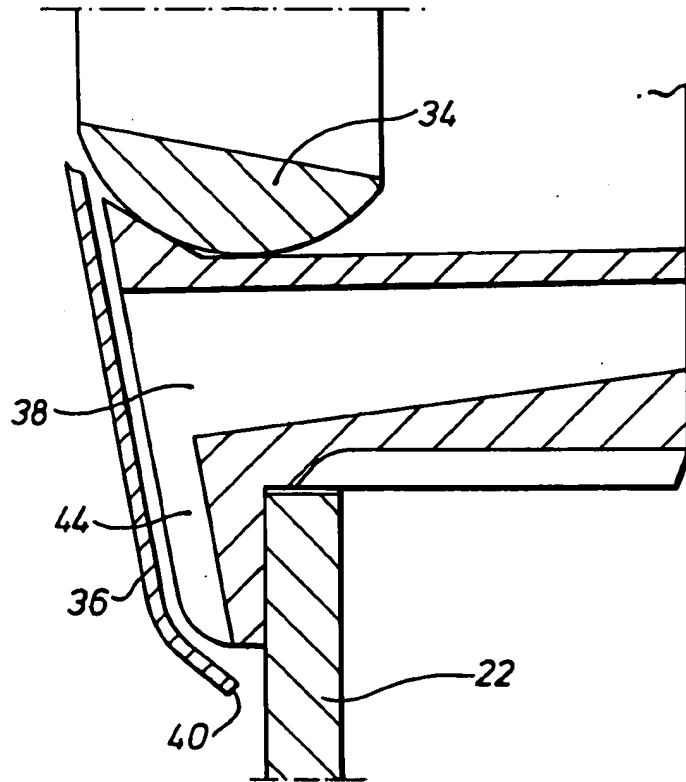


FIG. 3.

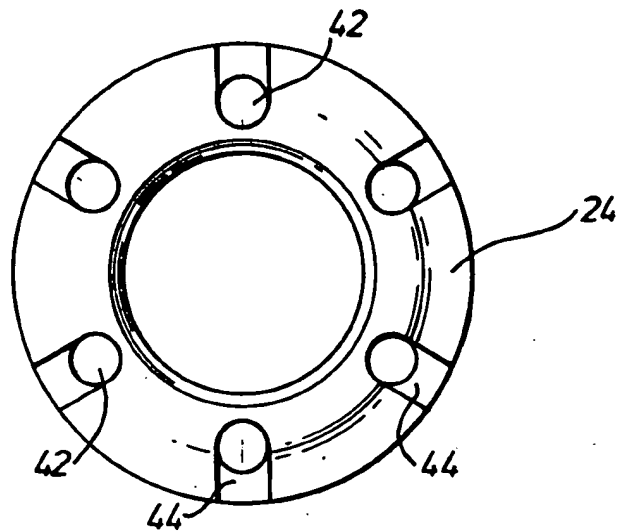


FIG. 4.



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EUROPEAN SEARCH REPORT

Application Number

EP 93 20 0749

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
D,X	EP-A-0 234 723 (BONDWELL LIMITED) * page 7, line 4 - line 14; figure 3 *	1	A61H33/02
X	US-A-4 586 204 (DANIELS) * column 5, line 39 - line 41; figure 7 * * column 6, line 51 - line 58; figure 8 *	1,2	
X	EP-A-0 119 581 (FIRMA FRANZ VIEGENER II) * page 5, line 21 - line 24; figures 1,3 *	1,7	
A	US-A-4 593 420 (TOBIAS ET AL.) * column 3, line 6 - line 39; figures *	1,2,4	
A	GB-A-2 177 941 (JACUZZI EUROPE SPA) * page 1, line 130 - page 2, line 4; figure 1 *	8	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A61H
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 19 JULY 1993	Examiner Mark Jones
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons & : member of the same patent family, corresponding document	

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